SERVICE MANUAL

CAR STEREO PLAYER

SANYO

FT222M

SPECIFICATIONS

Tape speed	1-7/8 IPS. ±2%
	4.75 cm/s
Fast forward time	160~170 sec. (C-60 cassette)
Wow & Flutter	0.2 % WRMS.
Crosstalk	Better than 30 dB. (track to track)
Signal to noise ratio (FM)	Better than 50 dB.
Output power	6 W (Max.) at 4 ohms, load
Frequency response (400Hz= 0dB, FM)	-80~ 12500 Hz
Speaker output impedance	4 or 8 ohms.
Power source	DC 14 V
Ground polarity	Negative pole ground.
Frequency range	AM 520~ 1605 kHz
	FM 88~ 108MHz
Sensitivity (for 500mW output)	AM 10 μV
	FM 6 μV
	(S/N= 30 dB)

NOTE : Specifications are subject to change without notice.

WM-7808

ALIGNMENT PROCEDURES

General

a) Test Conditions

Signal generator output:

Modulation frequency 400 Hz

Modulation percentage 30 %

Signal level just high enough to provide meter deflection.

Signal application:

Antenna receptacle thru the dummy antenna.

Output meter connection:

Across a speaker or a dummy load (4 ohms)

Setting of radio controls:

Volume control at maximum response.

Tone control at high note emphasis.

Power supply 14 V

★Location of the components for alignment are shown in MAIN PARTS IDENTIFICATION ILLUSTLATION (TOP VIEW).

Alignment of Head Azimuth

1. Insert a BASF 8 kHz standard test tape and set the unit in play mode.
2. Turn the azimuth adjusting screw until you obtain maximum reading on the VTVM.

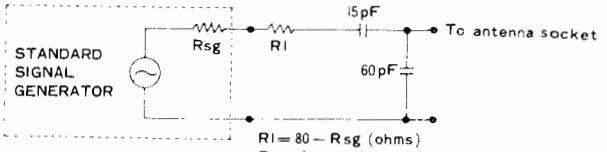
IF and AM Alignment

Step	Mode	Signal Input	Frequency of Signal GEN	Dial Setting of Radio	Components to be Adjusted for Maximum Output
1	AM	Thru dummy Ant (Fig.1)	460 kHz	Lowest end	IFT T302
2			510 ± 2kHz	Lowest end	OSC coil, T301
3			1645 ± 5kHz	Highest end	OSC trimmer, CT303
4			1400kHz	1400kHz	Ant. trimmer, CT301

Repeat steps 1, 2, 3 and 4.

With ratio installed in car and antenna fully extended, tune in a weak station near 1400kHz and adjust CT301 for maximum volume.

Fig. 1 DUMMY ANTENNA FOR AM RF ALIGNMENT



RI = 80 − Rsg (ohms)

Rsg : Internal resistance of a signal generator used.

FM Multiplex Alignment (PLL)

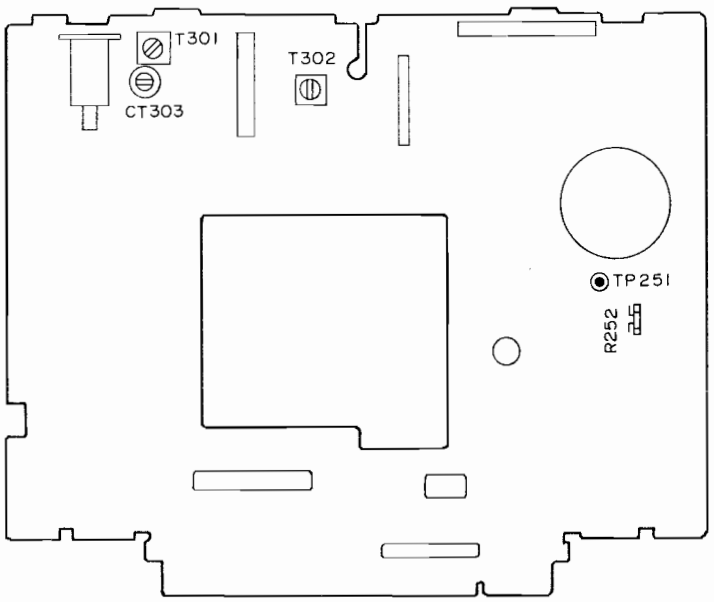
PRELIMINATIES :

1. A stereo signal modulator (SSM) is necessary to perform this alignment.
2. All adjustments below must be done, setting the dial pointer at 98 MHz on dial scale and applying 60 dB FM signal modulated by specified signals as described below.

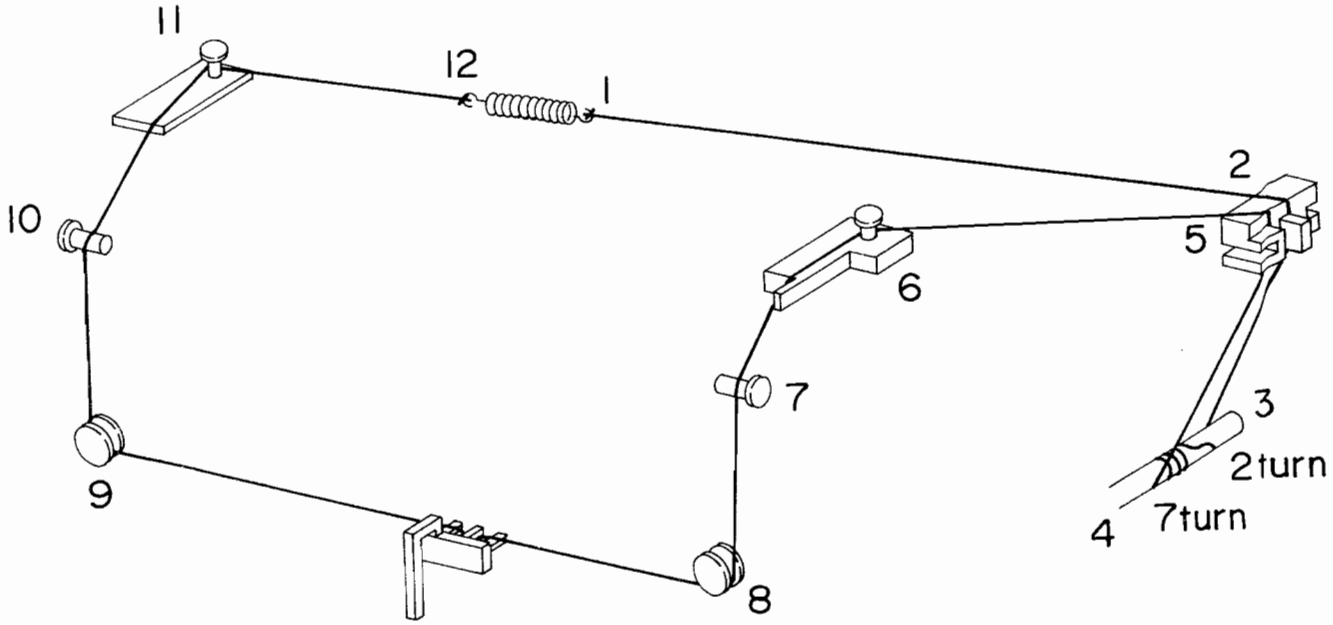
Step	Alignment	Instrument Connections		Adjustment
		Input	Output	
1	19 kHz Pilot	No signal condition	Connect frequency counter to TP251 of IC 251 and common ground.	Adjust VR (R 252) for frequency to be 19.00 kHz.

MAIN PARTS IDENTIFICATION ILLUSTRATION

MAIN P.C.B.
TOP VIEW



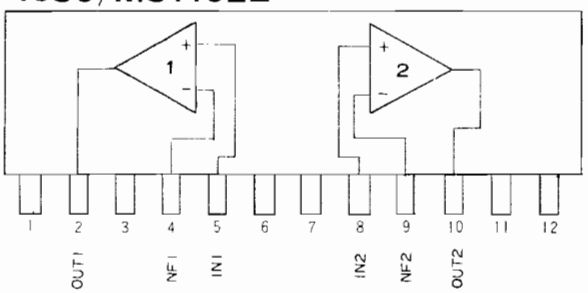
DIAL CORD STRINGING



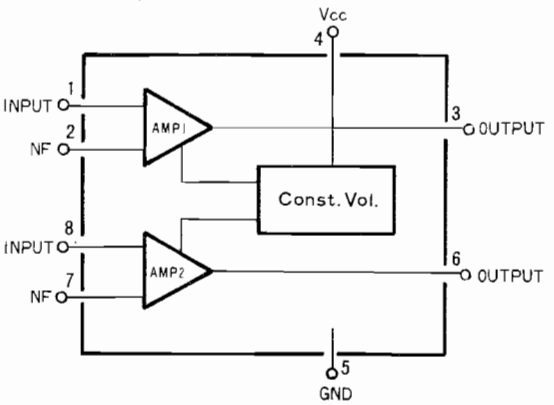
Pointer position : Highest end

IC FUNCTIONS

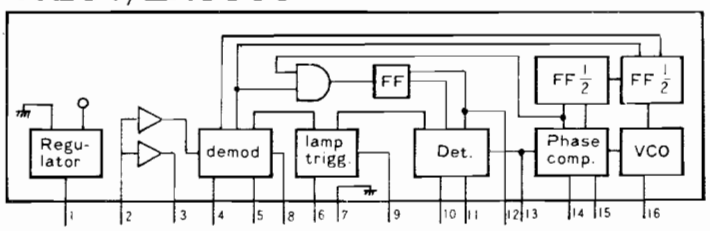
IC50/M51102L



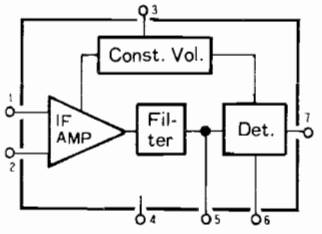
IC1/LA3161



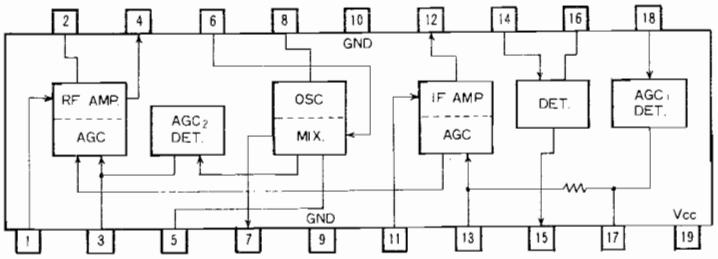
IC251/LA3365



IC201/μPC1028H



IC301/μPC1216V2



PARTS LIST

Key No.	Ref. No.	Part No.	Description	Q'ty
PACKAGE PARTS				
		R-4076414	Individual carton	1
		R-4172801	Styro-foam cushion, Right & Left	2
		R-4776675	Instruction book	1
		R-357529-1	Polyethylene bag, 260x340, Set	1
		R-357541	Polyethylene bag, 100x240	1
		R-4073962	Protector	1
ACCESSORY				
1		R-3973852	Trim panel	1
		R-111685B	Metal bracket	1
		R-A77992	Mounting hardware assembly	1
2		R-3972207	Knob, SW-VOL/TUNING	(2)
3		R-3972208-1	Knob, TONE/BALANCE	(2)
		R-118092	Washer	(2)
		R-247206	Nut	(4)
			Bolt, Hex Hd., 5x8	(1)
			Bolt, Hex Hd., 6x20	(1)
			Nut, Hex Hd., 6	(1)
		R-357541	Polyethylene bag, 100x240	(1)
CABINET				
4		R-1274270	Metal casing, Base	1
5		R-1273983A	Metal lid, Top	1
6		R-A77993	Nose panel assembly	1
7		R-2673593	Cassette door	1
8		R-157889	Shaft, Cassette door	1
9		R-157679	Coil spring, Cassette door	1
10		R-3975399	Back plate	1
11		R-3974581	Pulley	3
12		R-3975396	Pointer	1
13		R-3975397	Knob, REVERSE	1
14		R-3975397-L	Knob, F. F	1
15		R-3975398	Knob, EJECT	1
16		R-3975395-L	Knob, AM/FM	1
		R-4776676	Specification sheet	1
CHASSIS				
17		R-A77994	Printed circuit board assembly, MAIN	1
18		R-4174422-2	Printed circuit board, LED	1
19		R-4174422-3	Printed circuit board, TUNER	1
20		R-3973792A	Guide, Dial cord	1
21		R-157501	Coil spring, Dial cord	1
			Dial cord string, ϕ0.2x70mm	1
22		R-3971196	Joint	2
23		R-3971197	Joint	1
24		R-1274271	Metal bracket, Mechanism	1
25		R-1274272	Heat sink, IC	1
26		R-1274273	Metal bracket, Switch	1
27		R-118092	Washer	2
28		R-247206	Nut	2
COIL & TRANSFORMER				
	L1	R-W6707-3	Choke coil	1
	(MAIN)			
	L301	R-W1752	Choke coil	1
	L302	R-W1752-1	Choke coil	1
	T301	R-W87007	OSC coil	1
	T302	R-W5T7023-1	IF transformer	1
CONTROLS				
29		R-S872861	Tuner assembly	1
30	VR1-A~D, S1	R-R1167325-5	Variable resistor	1
31	VR2	R-R1167324-5	Variable resistor	1
	CT301	R-C0737-1	Trimmer	1
	(MAIN)			
	R252	R-R1110772-1	Preset resistor, 5k	1
	CT303	R-C0738	Trimmer	1
SEMICONDUCTORS				
	IC50		Integrated circuit, M51102L	1
	D1		LED, SLP-214B	1
	D2		LED, SLP-114B	1
	(MAIN)			
	IC1		Integrated circuit, LA3161	1
	IC251		Integrated circuit, LA3365	1
	IC301		Integrated circuit, μPC1216V2	1
	D3, 4		Diode, DS442 or 1S1588	2
	D201, 301		Diode, DS442 VG1	2
	D251		Zener diode, EQA02-08D	1
MISCELLANEOUS				
32		R-S872835	Mechanism assembly	1
	C59	R-C7713	Noise suppression capacitor	1
33		R-S37394	Cord, Power	1
		R-S17548	Fuse, 2A	1
34		R-S27192-1A	Antenna socket	1
		R-S871393	Pilot lamp	1
	(MAIN)			
	F301, 302	R-S17491-2	Ceramic filter	2
35	S3-A, B	R-S47745-1	Push switch, Tape-Radio	1
36	S4	R-S47400-5	Push switch, AM/FM	1
RESISTORS				
	(Resistors are of carbon type, ±5% allowance and $\frac{1}{4}$W unless otherwise noted.)			
	(MAIN)			
	R1, 101		100 ohm	2
	R2, 102, 253, 257		10 k ohm	4
	R3, 103		150 k ohm	2
	R4, 104, 259, 260		6.8 k ohm	4
	R5, 304		120 ohm	2
	R6, 8		560 ohm	2
	R201		39 k ohm	1
	R251		680 ohm	1
	R254, 301		1 k ohm	2
	R255, 256		3.9 k ohm	2
	R258		470 ohm	1
	R261		1.2 k ohm	1
	R302		220 ohm	1
	R303, 305		3.3 k ohm	2
	R306		33 k ohm	1
	R7		Metal oxide film, 130ohm, ±5%, 1W	1
	R262		Solid, 150ohm, ±10%, $\frac{1}{2}$W	1
CAPACITORS				
	(MAIN)			
	C4, 104		SBL ceramic, 0.022mfd, ±20%, 25V	2
	C52, 152, 309		SBL ceramic, 0.039mfd, ±20%, 25V	3
	C55, 155, 303, 306		SBL ceramic, 0.001mfd, ±20%, 25V	4
	C253, 313, 314		SBL ceramic, 0.01mfd, ±20%, 25V	3
	C258, 259		SBL ceramic, 0.027mfd, ±20%, 25V	2
	C304		SBL ceramic, 0.033mfd, ±20%, 25V	1
	C307		SBL ceramic, 0.0047mfd, ±20%, 25V	1
	C1, 101		Ceramic, 470pF, ±10%, 50V, B	2
	C251		Ceramic, 560pF, ±5%, 50V, SA	1
	C301		Ceramic, 560pF, ±10%, 50V, B	1
	C302		Ceramic, 47pF, ±10%, 50V, SL	1
	C308		Ceramic, 220pF, ±10%, 50V, S	1
	C56, 156		Mylar, 0.1mfd, ±20%, 50V	2
	C252		Mylar, 470pF, ±20%, 50V	1
	C2		Electrolytic, 10mfd/16V K	1
	C102		Electrolytic, 10mfd/16V MS	1
	C3, 103		Electrolytic, 47mfd/6.3V MS	2
	C5		Electrolytic, 100mfd/16V MS	1
	C51, 151, 254		Electrolytic, 4.7mfd/35V MS	3
	C53, 153, 317		Electrolytic, 47mfd/10V MS	3
	C54, 154		Electrolytic, 100mfd/6.3V MS	2
	C57, 157		Electrolytic, 330mfd/10V MS	2
	C58		Electrolytic, 820mfd/16V HS type	1
	C255		Electrolytic, 100mfd/10V MS	1
	C256		Electrolytic, 1mfd/50V K	1
	C257		Electrolytic, 0.47mfd/50V K	1
	C260		Electrolytic, 2.2mfd/50V MS	1

NOTES : 1. Part orders must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and/or resistors must be multiple of 10 pcs.

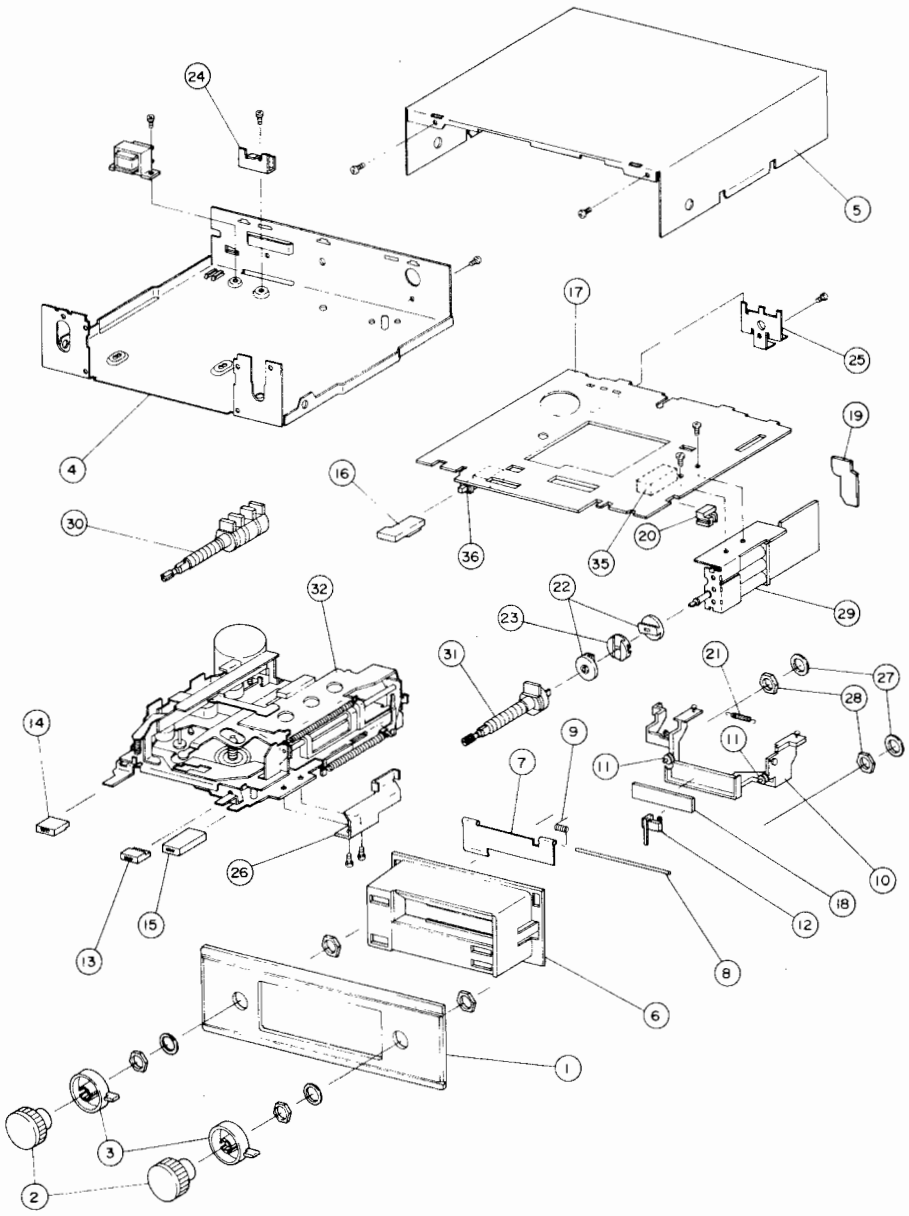
PARTS LIST

Key No.	Ref. No.	Part No.	Description	Q'ty
	C261		Electrolytic, 330mfd/10V HS type	1
	C305		Electrolytic, 10mfd/16V K	1
	C312		Electrolytic, 22mfd/10V MS	1
SCREW, NUT & WASHER				
NOTE : All screws, nuts and washers are made of steel unless otherwise noted.				
			Tap. Screw, Pan Hd., 3x4 B-tight Mechanism	1
			Tap. Screw, Pan Hd., 3x4 B-tight Metal lid	2
			Screw, Pan Hd., 3x3.5 S-tight Tuner	2

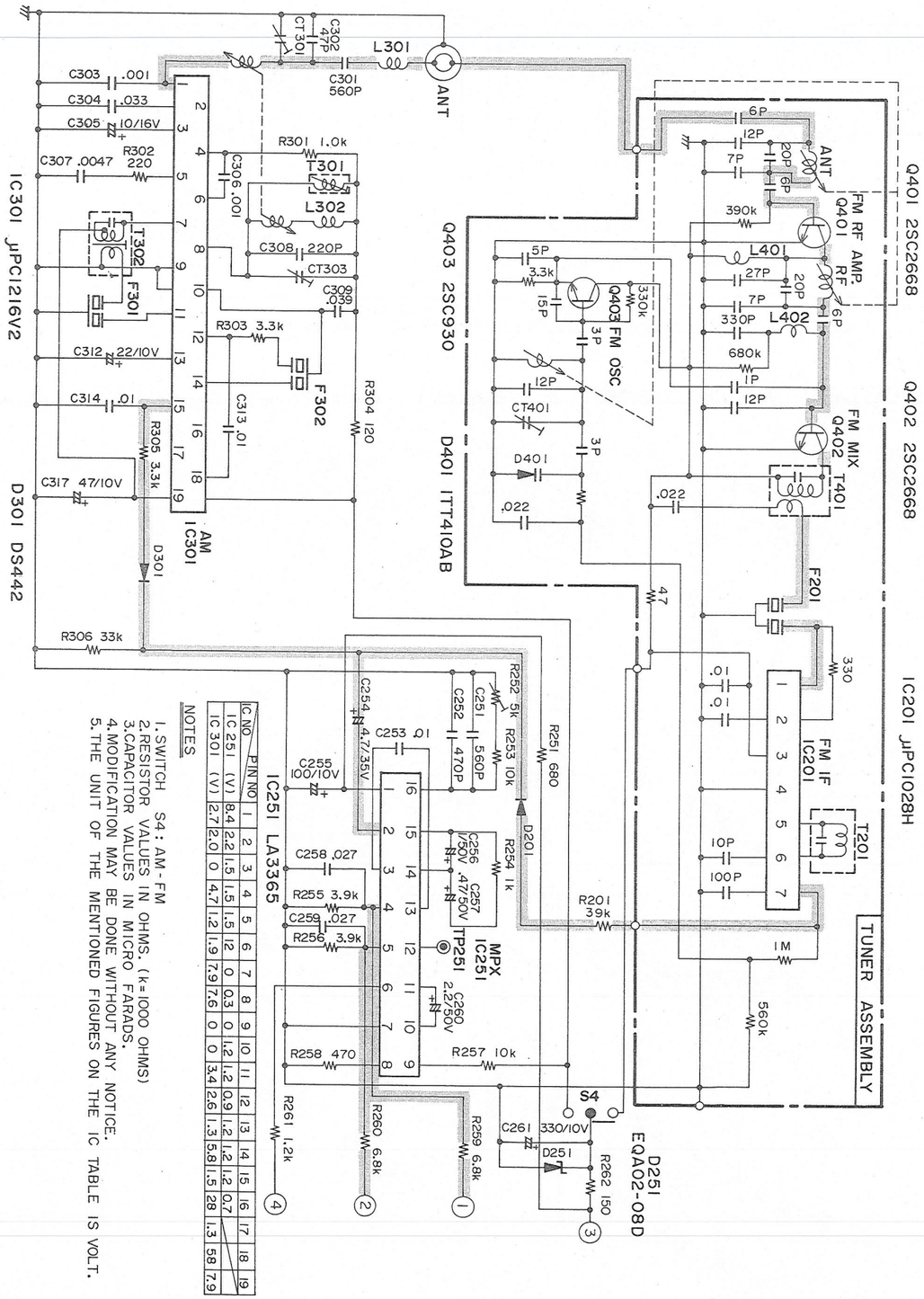
Key No.	Ref. No.	Part No.	Description	Q'ty
			Screw, Bind Hd., 2x3 S-tight Choke coil	1
			Screw, Pan Hd., 3x4 Antenna trimmer	1
			Tap. Screw, Washer Hd., 3x12 B-tight Heat sink	1
			Tap. Screw, Bind Hd., 2x5 P-tight LED P. C. B.	1
			Screw, Pan Hd., 2.3x3 Metal bracket, Switch	2
			Screw, Pan Hd., 2.3x6 S-tight Pulley	1

NOTES : 1. Part orders must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and/or resistors must be multiple of 10 pcs.

EXPLODED VIEW (CABINET & CHASSIS)



SCHEMATIC DIAGRAM

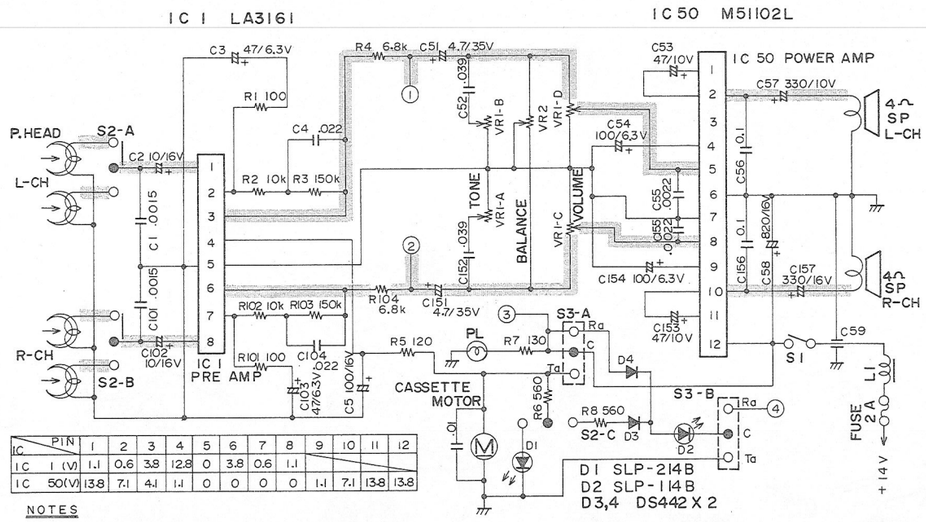


NOTES

1. SWITCH S4: AM-FM
2. RESISTOR VALUES IN OHMS. (k=1000 OHMS)
3. CAPACITOR VALUES IN MICRO FARADS.
4. MODIFICATION MAY BE DONE WITHOUT ANY NOTICE.
5. THE UNIT OF THE MENTIONED FIGURES ON THE IC TABLE IS VOLT.

IC NO	PIN NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
IC 251	(V)	8.4	2.2	1.5	1.5	1.5	12	0	0.3	0	1.2	1.2	0.9	1.2	1.2	1.2	0.7			
IC 301	(V)	2.7	2.0	0	4.7	1.2	1.9	7.9	7.6	0	0	3.4	2.6	1.3	5.8	1.5	2.8	1.3	5.8	7.9

SCHEMATIC DIAGRAM



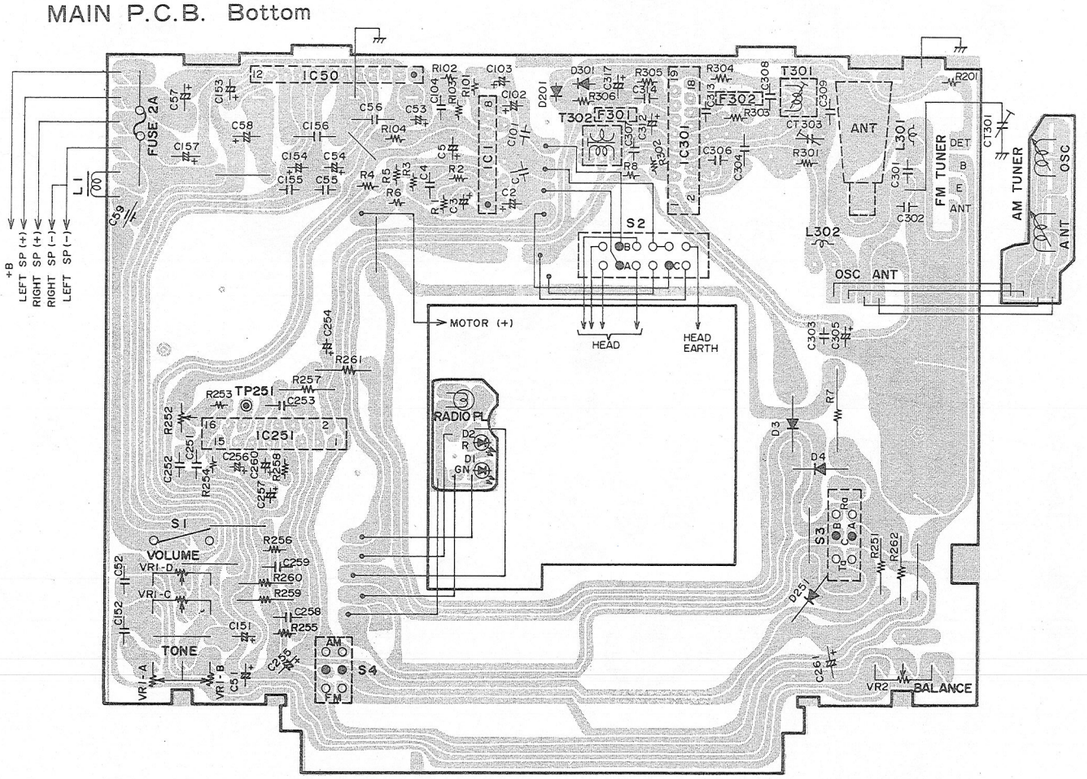
NOTES

1. RESISTOR VALUES IN OHMS. (k = 1000 OHMS)
2. CAPACITOR VALUES IN MICRO FARADS. (p = M.M. FARADS)
3. MODIFICATION MAY BE DONE WITHOUT ANY NOTICE.
4. THE MENTIONED FIGURE OF UNIT ON THE IC ARE VOLTS.
5. SWITCH S1: POWER SUPPLY S3: RADIO — TAPE
   S2-A ~ B: FORWARD — REVERSE

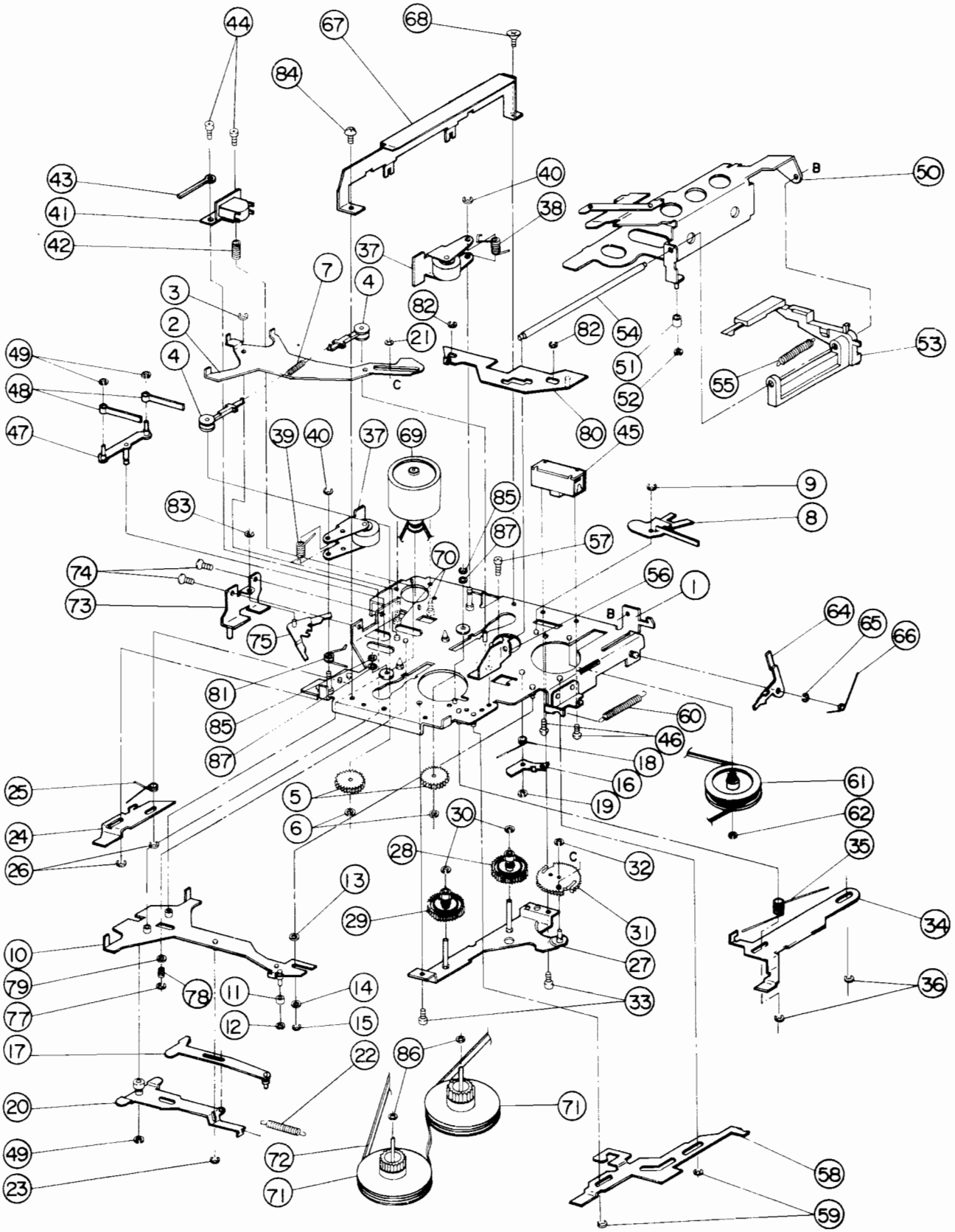
IC \ PIN	1	2	3	4	5	6	7	8	9	10	11	12
IC 1 (V)	1.1	0.6	3.8	12.8	0	3.8	0.6	1.1				
IC 50 (V)	13.8	7.1	4.1	1.1	0	0	0	0	1.1	7.1	13.8	13.8

WIRING DIAGRAM

MAIN P.C.B. Bottom



EXPLODED VIEW (CASSETTE MECHANISM)



PARTS LIST (CASSETTE MECHANISM)

Key No.	Ref. No.	Part No.	Description	Q'ty
CASSETTE MECHANISM (R-S872835)				
1		R-A78159	Chassis assembly	1
2		R-1271220A	Lever, Reverse	1
3			E-ring, Metal, E2	1
4		R-A78160	Idler gear base assembly	2
7		R-1570100	Spring, Idler	1
8		R-1271229	Lever, Switch select	1
9			E-ring, Metal, E2	1
10		R-A74674	Head lever assembly	1
11		R-2470218	Sleeve	1
12		R-3972246	Nylon push, 1.5	1
13			Thrust Washer, Metal, 3x0.25	1
14			Thrust Washer, Metal, 3x0.13	1
15			E-ring, Metal, E2	1
16		R-1271225	Stopper	1
17		R-A73392	Lever assembly, Knock	1
18		R-1571703	Tortion spring	1
19			E-ring, Metal, 3	1
20		R-A73870	Sencer lever (B) assembly	1
21			E-ring, Metal, E2	1
22		R-1570101A	Spring	1
23			E-ring, Metal, E2	1
24		R-1274175	Lever, F.F	1
25		R-1570112B	Spring, F.F lever	1
26			E-ring, Metal, E2	2
27		R-A78161	Metal bracket assembly, Reel	1
28		R-S871551	Rewind reel (A) assembly, Rear	1
29		R-S871552	Rewind reel (B) assembly, Front	1
30		R-3972246	Nylon push, 1.5	2
31		R-A78162	Reverse gear assembly	1
32		R-3972246	Nylon push, 1.5	1
33			Screw, Pan Hd., M2.6x5 S-tight	2
34		R-A78163	Reverse lever assembly, Manual	1
35		R-1570226B	Spring	1
36			E-ring, Metal, E2	2
37		R-A73397	Pinch roller lever assembly	2
38		R-1571758	Spring, Pinch roller rear	1
39		R-1572757	Spring, Pinch roller front	1
40			E-ring, Metal, E2	2
41		R-S07290-7 R-S07438	or Head	1
42		R-1570104	Spring, Azimuth	1
43		R-1271396	Lug, Lead	1
44			Screw, Pan Hd., M2x4 (+, −)	2
45		R-S47442	Switch, Head/output	1
46			Screw, Pan Hd., M2x4 (+, −)	2
47		R-A73868	Sencer lever (A) assembly	1
48		R-3972229A	Sencer	2

Key No.	Ref. No.	Part No.	Description	Q'ty
49		R-3972246	Nylon push, 1.5	3
50		R-A78164	Cassette case assembly	1
51		R-247801	Sleeve	1
52		R-3972246	Nylon push, 1.5	1
53		R-3972228F	Guide	1
54		R-1570097	Shaft	1
55		R-1570102	Spring	1
56		R-1274183	Metal bracket	1
57			Screw, Flat Hd., M2.6x5 S-tight	1
58		R-1274176	Lever, EJECT	1
59			E-ring, Metal, E2	2
60		R-1570103A	Spring, Cassette up and down	1
61		R-3975306	Pulley, Reverse	1
62		R-3972423	Nylon push, 2	1
			Thrust Washer, Metal, 2.5x0.13	1
64		R-1271234A	Lock lever, EJECT	1
65			E-ring, Metal, E2	1
66		R-1570113A	Spring, EJECT lock	1
67		R-1274189	Cassette guide	1
		R-1274178	Lug	1
68			Screw, Flat Hd., M2.6x5 S-tight	1
69		R-S57267 R-S57267-1	or Motor	1
70			Screw, Bind Hd., M2.6x3	2
71		R-A78165	Flywheel assembly	2
85			E-ring, Metal, 1.6	2
86			Thrust washer, Metal, 2x0.13	2
87			Thrust washer, Metal, 2x0.25	1
72		R-4470649A	Belt	1
73		R-A77883	Metal bracket assembly, Flywheel	2
74			Screw, Flat Hd., M2.6x5 S-tight	2
75		R-A74157	Sensor lever assembly	1
77			E-ring, Metal, E1.5	1
78		R-1570136	Spring	1
79			Prain Washer, Metal, 3	1
80		R-A74155	Lock lever assembly	1
81		R-1570339	Spring	1
82			E-ring, Metal, E2	2
83		R-3972423	Nylon push, 2.0	1
84			Screw, Truss Hd., M2.6x4 S-tight	1
5		R-3972224	Idler gear	2
6		R-3972246	Nylon push	2

NOTES : 1. Part orders must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and/or resistors must be multiple of 10 pcs.

SANYO ELECTRIC TRADING CO., LTD.
33, Hiyoshi-cho 2, Moriguchi-shi, Osaka-fu, 570, Japan
Jun/'82/1000 HI Printed in Japan.